IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	SUK	Examiner:	NEGRON, D.
Serial No.:	10/652,726	Group Art Unit:	2651
Filed:	August 29, 2003	Docket No.:	**HSJ920030101US1 (2004300-0598-B-DWL)**
Title:	METHOD, APPARATUS AND PROGRAM STORAGE DEVICE FOR PROVIDING PROTRUSION FEEDBACK FOR A READ/WRITE ELEMENT		

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence and the papers, as described hereinabove, are being deposited in the United States Postal Service, as first class mail, in an envelope addressed to: Mail Stop Appeal, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on February 21, 2006.

By: _____
David W. Lynch

NOTICE OF APPEAL

Mail Stop Appeal
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is an Appeal Brief submitted pursuant to 37 C.F.R. § 41.37 for the above-referenced patent application. Please charge Deposit Account No. 50-2587 (**HSJ920030101US1**) in the amount of $500.00 for this brief in support of appeal as indicated in 37 C.F.R. § 41.20(b)(2).

I. Real Party in Interest

The real party in interest is HITACHI GLOBAL STORAGE TECHNOLOGIES NETHERLANDS B.V., having a place of business at Locatellikade 1, Parnassustoren, 1076 AZ Amsterdam, The Netherlands (hereinafter called HITACHI).

II. Related Appeals and Interferences

Appellants are unaware of any related appeals, interferences or judicial proceedings.

III. Status of Claims

Claims 1-4, 6-12, 14-20 and 22-27 were rejected. Claims 5, 13 and 21 were objected to. Claims 7, 15, 23 and 26-27 have been canceled. Claims 1-4, 6, 8-12, 14, 16-20, 22 and 24-25 are presented for appeal and may be found in the attached Appendix of Appealed Claims in their present form.

IV. Status of Amendments

An initial Office Action was mailed on December 12, 2004. A response to the initial Office Action was mailed on March 14, 2005. A final Office Action was mailed on July 13, 2005. A response to the final Office Action was filed on September 13, 2005, under 37 C.F.R. § 1.116. By way of Advisory Action mailed November 25, 2005, the amendment to the claims presented in the response of September 13, 2005 were noted as being entered into the record, but were deemed to not place the application in condition for allowance.

V. Summary of Invention

A method, apparatus and program storage device for providing protrusion feedback for a read/write element is disclosed.

In independent claim 1, a method for providing protrusion feedback for a read/write element is claimed. The method includes writing reference data at a radius on a recording medium using a head (910, page 16, lines 14-16), attempting to read the written reference data (920, page 16, lines 17-18), determining whether the read attempt was successful (930, page 16, line 19), adjusting a level of heating on a heating element at the head to increase protrusion of the head (940, page 16, line 20) until the read attempt is successful (934, page 16, line 21), determining whether the heating due to the writing process is too low to provide correct data writing (970, page 17, lines 8-9) and adjusting the heating until the writing is

determined to be correct (972, page 17, lines 10-11).

In independent claim 9, a drive system signal processor is claimed. The drive system signal processor (350, page 12, lines 19-20) includes a memory (370, page 17, line 16) for storing data thereon and a processor (372, page 17, line 17), coupled to the memory (370, page 17, line 16), for writing with a head reference data at a radius on a recording medium (910, page 16, lines 14-16), attempting to read the written reference data (920, page 16, lines 17-18), determining whether the read attempt was successful (930, page 16, line 19) and adjusting a level of heating on a heating element for the head to increase protrusion of the head (940, page 16, line 20) until the read attempt is successful (934, page 16, line 21), wherein the processor determines whether the heating due to the writing process is too low to provide correct data writing (970, page 17, lines 8-9) and adjusts the heating until the writing is determined to be correct (972, page 17, lines 10-11).

In independent claim 17, a storage device is claimed. The storage device (300, page 12, line 14) includes a magnetic recording medium (330, page 12, line 18) for recording data thereon, a transducer (310, page 12, line 18) having an MR element (440, page 13, line 6) for reading data stored on the magnetic recording medium (330, page 12, line 18) and a heating element (850, page 16, line 3) for increasing protrusion, a motor (360, page 12, lines 20-21), coupled to the magnetic recording medium (330, page 12, line 18), for translating the magnetic recording medium (330, page 12, line 18), an actuator (320, page 12, line 17), coupled to the transducer (310, page 12, line 18), for translating the transducer (310, page 12, line 18) relative to the magnetic recording medium (330, page 12, line 18) and a storage device signal processor (350, page 12, lines 19-20), coupled to the motor (360, page 12, lines 20-21), transducer (310, page 12, line 18) and actuator (320, page 12, line 17) , for writing

with the transducer (310, page 12, line 18) reference data at a radius on the magnetic recording medium (910, page 16, lines 14-16), attempting to read the written reference data (920, page 16, lines 17-18), determining whether the read attempt was successful (930, page 16, line 19) and adjusting the level of heating on the heating element to increase protrusion of the transducer (940, page 16, line 20) until the read attempt is successful (934, page 16, line 21), wherein the storage device signal processor determines whether the heating due to the writing process is too low to provide correct data writing (970, page 17, lines 8-9) and adjusts the heating until the writing is determined to be correct (972, page 17, lines 10-11).

In independent claim 25, a program storage device (388, page 17, line 15) readable by a computer and tangibly embodying one or more programs of instructions (390, page 17, line 16-20) executable by the computer to perform a method for providing protrusion feedback for a read/write element is claimed. The method includes writing reference data at a radius on a recording medium using a head (910, page 16, lines 14-16), attempting to read the written reference data (920, page 16, lines 17-18), determining whether the read attempt was successful (930, page 16, line 19), adjusting a level of heating on a heating element at the head to increase protrusion of the head (940, page 16, line 20) until the read attempt is successful (934, page 16, line 21), determining whether the heating due to the writing process is too low to provide correct data writing (970, page 17, lines 8-9) and adjusting the heating until the writing is determined to be correct (972, page 17, lines 10-11).

VI. Grounds of Rejection

Appellant has attempted to comply with new rule 37 C.F.R. § 41.37(c) by providing the Office Action's grounds of rejection verbatim, followed by an argument section corresponding thereto.

A. In paragraph 2 on page 2 of the Office Action, claims 1, 6-9, 14-17, and 22-27 were rejected under 35 U.S.C. § 103(a) over Forehand (U.S. Patent No. 6,760,174) in view of Kamijima (U.S. Patent Pub. No. 2003/0099054).

B. In paragraph 3 on page 2 of the Office Action, claims 2-4, 8, 10-12, 16, and 18-21 were rejected under 35 U.S.C. § 103(a) over Forehand as modified by Kamijima, and in further view of Tokuyama et al. (U.S. Patent No. 6,594,104).

VII. Argument

A. CLAIMS 1, 9, 17 AND 25 ARE PATENTABLE OVER FOREHAND (U.S. PATENT NO. 6,760,174) IN VIEW OF KAMIJIMA (U.S. PATENT PUB. NO. 2003/0099054).

1. Forehand, Kamijima And Tokuyama et al., alone or in combination Fail To Disclose, Teach Or Suggest the Limitations of Claims 1, 9, 17 And 25.

The initial Office Action of December 14, 2004 asserts that Forehand teaches increasing the protrusion of the transducer. The Office Action equates the increasing of the protrusion of the read head with the decreasing of fly height of the slider. The Office Action further indicates that Forehand teaches increasing the protrusion until a read attempt is successful. The Office Action admits that Forehand fails to show the specifics of increasing the protrusion through the use of a heating element, adjusting the level of heating on the heating element to increase protrusion and attempting to write or read data at different drive temperatures.

Nevertheless, the Office Action asserts that Kamijima discloses a heater in a transducer for thermally expanding and protruding an air bearing surface during both write and read processes for the purpose of compensating for a decreased quality of a read signal. The Office Action further asserts that Kamijima discloses controlling the fly height of the transducer by adjusting the heating value of the heater.

Appellant respectfully traverses the rejection. Appellant respectfully submits that Kamijima teaches a transducer having a heating element that can be controlled to adjust an amount of protrusion by the read head.

However, Appellant asserts that even if the references are combined, the resulting combination does not equate with the invention as recited in claims 1, 8, 17 and 25. Forehand teaches lowering the fly height of a slider and sweeping the slider across the recording media to remove any debris thereon. The slider is then raised and shook to remove the debris.

According to Forehand, "for every disc drive, a fly height of a read/write head relative to a recording surface of a disc is specified for the disc drive. The specified fly height for the read/write head relative to the disc is referred to as a data transfer fly height or the operating fly height. . . . With the read/writs head 118 positioned at the inner most data track 120, the fly height of the read/write head 118 is lowered to substantially 30% of the minimum fly height of the read/write head 118. Then, the servo controller is directed to reposition the read/write head 118, also referred to as seeking to an outer most data track of the recording surface 109 to "sweep" the recording surface 109."

After removing the debris, the slider is accordingly set at the specified fly height. Forehand states: "The sub-routine loops by resetting the internal software following the shake off of the debris from the read/write head 118 until the microprocessor 142 conducts a data transfer operation."

Furthermore, Forehand states: "The read/write head 118 remains at the maximum fly height setting until a seek command is received. Upon receipt of the seek command the read/write head 118 is lowered to a data transfer fly height by process step 220. Once this is achieved, the end step 222 concludes the process and the seek command is executed."

Accordingly, at best, the combination of Forehand and Kamijima teach that when a read error occurs, the slider is lowered and swept across the recording media to remove the debris, the slider is shook, the slider is lowered to the specified fly height, a read operation is performed and the protrusion may be adjusted using a heater.

However, Forehand and Kamijima, alone of in combination, fail to teach adjusting a level of heating on a heating element at the head to increase protrusion of the head until the read attempt is successful. Forehand and Kamijima, alone of in combination, fail to link the

setting of the protrusion to the method of adjusting a level of heating on a heating element at the head to increase protrusion of the head until the read attempt is successful. Kamijima discloses that the amount of protrusion may be controlled, but Kamijima does not disclose the adjustment of the protrusion during a read process to determine the proper amount of protrusion to provide correct data reading.

Moreover, Forehand and Kamijima, alone of in combination, fail to teach determining whether the heating due to the writing process is too low to provide correct data writing and adjusting the heating until the writing is determined to be correct. Again, Forehand and Kamijima, alone of in combination, simply fail to link the setting of the protrusion to the method of adjusting a level of heating on a heating element at the head to increase protrusion of the head until the read attempt is successful.

In addition, Appellant respectfully submits that the phrase "increasing the fly height" as used in Forehand does not equate with increasing the protrusion of a read head. Forehand discusses adjusting the fly height of the entire slider. Thus, Forehand teaches away from the present invention.

Tokuyama et al. fail to remedy the deficiencies of Forehand and Kamijima. Tokuyama et al. merely discloses using a table to record radial displacement values for a given temperature of an IC on a suspension. However, Tokuyama et al. has nothing to do with determining whether the heating due to the writing process is too low to provide correct data writing and adjusting the heating until the writing is determined to be correct by adjusting a level of heating on a heating element at the head to increase protrusion of the head until the read attempt is successful.

Accordingly, claim 1 is patentable over Forehand, Kamijima and Tokuyama et al. Claims 9, 17 and 25 include similar limitations and are therefore patentable for the same reasons.

2. Forehand, Kamijima And Tokuyama et al., alone or in combination Fail To Disclose, Teach Or Suggest the Limitations of Claim 2, 3, 8, 10, 11, 16, 18, 19 and 24.

Claim 2 requires recording the level of heating required to read the reference data successfully. Similarly claim 8 requires recording the heating level for obtaining correct data

writing. Claim 3 recites that the recording further comprises recording the level of heating on a disk. Claims 10, 11, 16, 18, 19 and 24 include similar limitations.

As discussed above, Forehand and Kamijima fail to mention the recording of level of heating required to read the reference data successfully. While Tokuyama et al. teaches record radial displacement values for a given temperature of an IC on a suspension, Tokuyama et al. fails to suggest recording the level of heating required to read or write reference data. Tokuyama et al. fails to suggest recording the level of heating on a disk.

Accordingly, claims 2, 3, 8, 10, 11, 16, 18, 19 and 24 are patentable over Forehand, Kamijima and Tokuyama et al.

3. Forehand, Kamijima And Tokuyama et al., alone or in combination Fail To Disclose, Teach Or Suggest the Limitations of Claim 4, 6, 12, 14, 20 and 22.

Claim 4 recites that the attempting to read the reference data is performed at different drive temperatures. Claims 6, 12, 14, 20 and 22 include similar limitations.

Forehand describes the removal of debris from the recording media. Kamijima merely discloses the heating of a heater to increase the protrusion of a read head. Tokuyama et al. merely teaches recording radial displacement values for a given temperature of an IC on a suspension.

Accordingly, claims 4, 6, 12, 14, 20 and 22 are patentable over Forehand, Kamijima and Tokuyama et al.

VIII. Conclusion

In view of the above, Appellants submit that the rejections are improper, the claimed invention is patentable, and that the rejections of claims 1-4, 6, 8-12, 14, 16-20, 22 and 24-25 should be reversed. Appellants respectfully request reversal of the rejections as applied to the appealed claims and allowance of the entire application.

Respectfully submitted,

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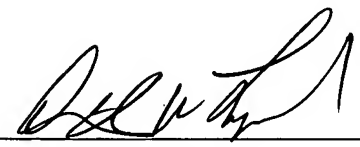
By: 

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APPENDIX OF APPEALED CLAIMS FOR APPLICATION NO. 10/652,726

1. (Previously Presented) A method for providing protrusion feedback for a read/write element, comprising:

writing reference data at a radius on a recording medium using a head;

attempting to read the written reference data;

determining whether the read attempt was successful;

adjusting a level of heating on a heating element at the head to increase protrusion of the head until the read attempt is successful;

determining whether the heating due to the writing process is too low to provide correct data writing; and

adjusting the heating until the writing is determined to be correct.

2. (Original) The method of claim 1 further comprising recording the level of heating required to read the reference data successfully.

3. (Original) The method of claim 2, wherein the recording further comprises recording the level of heating on a disk.

4. (Original) The method of claim 2, wherein the attempting to read the reference data is performed at different drive temperatures.

5. (Original) The method of claim 4, wherein the recording the level of heating required to read the reference data successfully further comprises providing the heating levels for the different temperatures in a look-up table for providing a correct heating level at any temperature.

6. (Original) The method of claim 1, wherein the attempting to read the reference data is performed at different drive temperatures.

7. (Canceled)

8. (Previously Presented) The method of claim 1 further comprises recording the heating level for obtaining correct data writing.

9. (Previously Presented) A drive system signal processor, comprising:

a memory for storing data thereon; and

a processor, coupled to the memory, for writing with a head reference data at a radius on a recording medium, attempting to read the written reference data, determining whether the read attempt was successful and adjusting a level of heating on a heating element for the head to increase protrusion of the head until the read attempt is successful, wherein the processor determines whether the heating due to the writing process is too low to provide correct data writing and adjusts the heating until the writing is determined to be correct.

10. (Original) The drive system signal processor of claim 9, wherein the processor records the level of heating required to read the reference data successfully.

11. (Original) The drive system signal processor of claim 10, wherein the processor records the level of heating on a disk.

12. (Original) The drive system signal processor of claim 10, wherein the processor performs attempts to read the reference data at different drive temperatures.

13. (Original) The drive system signal processor of claim 12, wherein the processor stores the heating levels for the different temperatures in a look-up table for providing a correct heating level at any temperature.

14. (Original) The drive system signal processor of claim 9, wherein the processor attempts to read the reference data at different drive temperatures.

15. (Canceled)

16. (Previously Presented) The drive system signal processor of claim 9, wherein the processor records the heating level for obtaining correct data writing.

17. (Previously Presented) A storage device, comprising:

a magnetic recording medium for recording data thereon;

a transducer having an MR element for reading data stored on the magnetic recording medium and a heating element for increasing protrusion;

a motor, coupled to the magnetic recording medium, for translating the magnetic recording medium;

an actuator, coupled to the transducer, for translating the transducer relative to the magnetic recording medium; and

a storage device signal processor, coupled to the motor, transducer and actuator, for writing with the transducer reference data at a radius on the magnetic recording medium, attempting to read the written reference data, determining whether the read attempt was successful and adjusting the level of heating on the heating element to increase protrusion of the transducer until the read attempt is successful, wherein the storage device signal processor determines whether the heating due to the writing process is too low to provide correct data writing and adjusts the heating until the writing is determined to be correct.

18. (Original) The storage device of claim 17, wherein the storage device signal processor records the level of heating required to read the reference data successfully.

19. (Original) The storage device of claim 18, wherein the storage device signal processor records the level of heating on a disk.

20. (Original) The storage device of claim 18, wherein the storage device signal processor performs attempts to read the reference data at different drive temperatures.

21. (Original) The storage device of claim 20, wherein the storage device signal processor stores the heating levels for the different temperatures in a look-up table for providing a correct heating level at any temperature.

22. (Original) The storage device of claim 17, wherein the storage device signal processor attempts to read the reference data at different drive temperatures.

23. (Canceled)

24. (Previously Presented) The storage device of claim 17, wherein the storage device signal processor records the heating level for obtaining correct data writing.

25. (Previously Presented) A program storage device readable by a computer, the program storage device tangibly embodying one or more programs of instructions executable by the computer to perform a method for providing protrusion feedback for a read/write element, the method comprising:

writing reference data at a radius on a recording medium using a head;

attempting to read the written reference data;

determining whether the read attempt was successful; ~~and~~

adjusting a level of heating on a heating element at the head to increase protrusion of the head until the read attempt is successful;

determining whether the heating due to the writing process is too low to provide correct data writing; and

adjusting the heating until the writing is determined to be correct.

26-27. (Canceled)

APPENDIX OF EVIDENCE FOR APPLICATION NO. 10/652,726

Appellants are unaware of any evidence submitted in this application pursuant to 37 C.F.R. §§ 1.130, 1.131, and 1.132.

APPENDIX OF RELATED PROCEEDINGS FOR APPLICATION NO. 10/652,726

As stated in Section II above, Appellants are unaware of any related appeals, interferences or judicial proceedings.